ART. I.—*On some Remarkable Changes which have taken place in the Flowers of the Plantago Major.* By THOMAS SHEARMAN RALPH, M.R.C.S., Assoc. Linn. Soc. Lond.

[Read 2nd May, 1861.]

The observations I have to make this evening, refer to some remarkable changes which have taken place in the flowers of the Plantago Major, and which, as far as I can learn, have never been noticed to occur in this plant, although changes like these are frequent in the common rose, and have been met with also in many other kinds of plants.

The changes to which I refer are well known to the physiological botanist, and present him with many interesting confirmations of what is known and acknowledged as to the morphological origin of the parts of the plant composing the flower.

All who are in the habit of enjoying an ordinary acquaintance with flowers, are well aware of the existence and value in some respects of what are termed double flowers,—plants in which flowers are produced possessing double sets of petals, in place of a few, say four or five, the remaining organs of the flower being converted into petals and no seeds yielded by the specimen. Now these changes are carried on still further in some plants, and are useful in confirming the theories which are held relative to the nature of the different parts of the flower, *i.e.*, that all may be regarded as so many modified leaves arranged according to certain laws around the stem.

In order that I may be better understood, I will first introduce the plant to your notice as it commonly occurs. It is termed the Plantain or rib-grass, and is a common plant in Great Britain. It possesses large leaves placed in a rosette on the ground, these being marked with strong ribs from the centre, the flower stem rising to a height of several inches, bearing at its top a cone of small flowers, which, when fully ripened, form seed vessels placed at a distance from each

other on the increased spike or flower stalk, and in this condition it is commonly given as food to small cage birds, as the canary, &c. The flowers are very small, but easily distinguished by means of a common lens. The calyx consists of four sepals. The corolla is one with four divisions, and of a scaly texture, four long stamens and a single style. The germ or ovary is, in the early stage, two-celled, and contains a few ovules. The capsule, or ripened fruit, is usually one-celled, and two or three seeds or more may ripen, and the capsule top splits off like a lid.

Now the specimen in question, I observed, had run to seed, but several of the spikes, in place of fruiting as usual, had metamorphosed the carpel as follows: it had become longer than usual, and in most instances enlarged at its upper extremity, and also unequally so, and when fully developed, the styles having fallen off, it dehisced or split in two at the top. On opening the capsules, each was found to contain a small cluster of leaves in place of the ovules. On some I counted as many as ten or twelve leaves. Now, in some botanical works, and I can quote Lindley's *Vegetable Kingdom*, it is stated that the ovary is composed of a single carpel, and seldom four-celled. (Page 642). From an examination of the carpel in this specimen, it will be seen that the ovary is really composed of two carpellary leaves; first, because the carpel is in some instances more developed on one side, *i.e.*, posteriorly, and next, that a sutural line may be seen separating the anterior from the posterior portions; and again, that the fully grown capsule in this state dehisces at the top into two. I have taken one of such carpellary portions, and having decolorized it, I find that the carpel presents all the character of a leaf, it has a central vein with lateral anastomosing ones.

The other point of interest in this specimen is, that the ovular buds, in place of remaining as such had in some instances, become further developed into florets, each being a miniature of the parent flower—four sepals, four stamens.